

CENTER FOR INDUSTRIAL RESEARCH AND SERVICE

Partnering with the Iowa Manufacturing Extension Partnership

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roadmap** *By Tim Sullivan, CIRAS*

Iowa Metal Casting Director Doug Miller (standing), John Brackin, chair of the Iowa metal casters steering committee, and industry representatives participate in a vision and roadmap workshop made possible by Iowa metal casters.

For the past several years, an innovative Industries of the Future (IOF) strategy has guided the U.S. Department of Energy's Office of Industrial Technology. This initiative focuses on the nine most energy-intensive industries: agriculture, aluminum, chemicals, forest products, glass, metal casting, mining, steel, and petroleum refining. Iowa, which joined IOF in 2000, is one of a growing number of states taking advantage of its progressive policies.

During the past year, the Iowa IOF has provided an opportunity for metal casters in the state to work together in forming a vision and roadmap for their industry.

Three industry representatives—John Brackin from John Deere Foundry in Waterloo, Phil Bruno of Sivyer Steel in Bettendorf, and Doug Six of Progressive Foundry in Perry—led this effort in collaboration with CIRAS staff and Doug Miller, the director of the Metal Casting Center at the University of Northern Iowa. Funding was provided by the Iowa Department of Natural Resources and the Iowa Energy Center.

Following is an executive summary of the vision and roadmap that emerged from this partnership.

Executive Summary

Four workshops were held from March through May 2001 to gather input for the creation of a vision and a roadmap for Iowa metal casters. Although the Iowa metal casting vision and roadmap parallel the national documents in structure, they also identify the unique needs of Iowa metal casters that must be addressed to ensure the industry's viability. Following are six areas that have been identified in the vision and roadmap and the top three priorities for Iowa metal casters.

Products and markets

Goal: Increase casting sales by 10%.

Vision: Iowa metal casters will become preferred suppliers because of compressed lead times, high quality, value-enhancing solutions, competitive pricing, and ease of doing business.

Top priorities in the roadmap:

1. Train/educate engineers in foundry process and casting applications
2. Develop ways to demonstrate quality and value of cast metal products
3. Train/educate purchasers in casting applications

Materials technology

Vision: Iowa metal casters will make effective use of scrap and virgin materials to economically produce higher-value components that weigh less, provide better quality, and consume fewer units of energy to produce. Materials cast will be environmentally friendly. Metal casters will be able to quickly, effectively, and economically

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CIRAS Mission Statement

The mission of CIRAS is to enhance the performance of Iowa industry and associated entities through education and technology-based services.

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How plant layout simulation can help your company

By Jennifer Maher, CIRAS, and Mike Willet, CIRAS

Making sound system decisions requires a thorough understanding of the system involved. Plant layout simulation and modeling is a powerful tool that can help you understand your system and enable you to make the best possible decisions for your manufacturing needs.

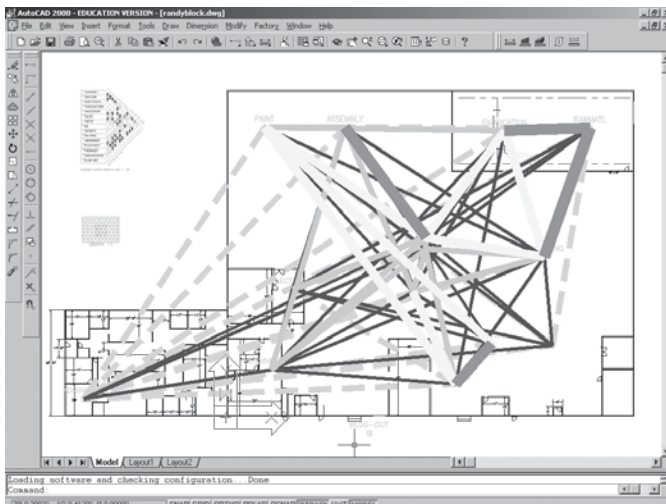
Today, simulation is one of the most frequently used system analysis methods for plant layout. Supported by powerful desktop computers and software, it is becoming the tool of choice for evaluating manufacturing systems performance. CIRAS has helped a number of Iowa manufacturing plants benefit from plant layout simulation. Two such companies include Hicklin Engineering LC (HELC) and R. S. Bacon Veneer.

Hicklin Engineering LC

HELC, a recognized leader in testing transmissions and rebuilding industry equipment, consisted of three separate locations with corporate headquarters in Urbandale, Iowa. It had leased a 56,500-square-foot facility in Des Moines, but wanted to combine all three of its current production facilities into one central site in Des Moines. The company, however, needed assistance in laying out this site to include the operations and equipment from all three sites.

Process

Working with a team of HELC employees, CIRAS Industrial Specialist Mike Willett constructed a relationship chart to determine what departments would be included in the study, the relationships between these departments, and the square-footage requirements for each department. This data along with an AutoCAD™ drawing of the new facility were analyzed using the FactoryPLAN™ simulation software, and an optimized layout was presented to generate potential layout ideas. Each team member then submitted his/her ideas, which were then modeled and scored, based on distance and relationship weighting.



FactoryPLAN™ simulation showing distance and relationship weighting.

Using the model results, members were informed of problem areas and were given feedback and direction to assist them in improving the scenario. Additionally, they completed a factor/consideration worksheet that listed all the factors that would come into play in making the final decision. The president of HELC also assigned a weighting to each factor. All scenarios were then evaluated by these factors, and a final block layout was chosen. Once the block layout was established, the entire layout process was repeated for the machining department, except in this instance machines were used in the modeling process instead of department blocks.

Results

The project resulted in a detailed AutoCAD™ drawing of the new facility showing the location of all functional department areas and machines in the machining department. Currently, HELC is actively relying on this plan as it moves two of its facilities into the building. The

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Benefits of plant layout simulation

Plant layout simulation is a non-disruptive process that allows controlled experimentation on almost any type of system with many complex factors. It analyzes a system to provide information on performance changes over time and help predict likely outcomes. The benefits offered by simulation include the ability to

- account for complex factors and relationships
- show performance changes over time (dynamically)
- permit experimentation and answer “what if” questions
- evaluate changes without disrupting the actual system
- stimulate ideas and promote total system optimization
- use animation for “realistic” representation
- provide cost-effective ways to develop and evaluate system designs

Many of the simulation packages available provide visually realistic and convincing output that stimulates team interest and participation. Overall, simulation is easy to use and understand and can provide cost-effective “total system” solutions to the many “what if” questions in manufacturing.

Areas that can be evaluated in plant layout simulation include

- travel distance
- material handling
- departmental relationships
- space requirements
- machine placement
- cost of facility

Distance education takes a virtual twist

By Rebecca Sidler Kellogg, *Engineering Distance Education*

This spring semester, under the leadership of Dr. Carolina Cruz-Neira, three engineering units at Iowa State University are collaborating on an unprecedented multi-media educational venture. The Virtual Reality Application Center (VRAC), the Department of Industrial and Manufacturing Systems Engineering (IMSE), and Engineering Distance Education (EDE) have partnered to bring a cutting-edge virtual environments and applications course to ISU. This course, offered as IE 584X, allows students and instructors from multiple institutions to learn from each other and leverage the efforts of leading researchers in a highly complex and technical area.

The unique nature of this course is that the instruction originates from several prominent academic and research institutions across the country and is being taught by researchers who are world-renown pioneers in the field of virtual environments. The course also introduces the challenge of simultaneously delivering the lectures to five institutions across four time zones.

Iowa State University, together with Old Dominion University, is one of the lead institutions in the production of the course.

There is a total of eleven contributors that include

- Jim Ballas, Naval Research Laboratory
- Doug Bowman, Virginia Tech
- Greg Burdea, Rutgers
- Carolina Cruz-Neira, Iowa State University
- Steve Ellis, NASA/Ames Research Center
- Deb Harm, NASA/Johnson Space Center
- Bowen Loftin, Old Dominion University
- Ahmed Noor, Old Dominion University
- Bill Sherman, NCSA/University of Illinois - Urbana/Champaign
- Mike Zyda, Naval Postgraduate School

The course is being offered in a synchronous mode with Old Dominion University (ODU) in Norfolk, Virginia, serving as the coordinating site. In addition, ISU is offering a live Web cast of the course to Deere & Company engineers in Moline, Waterloo, and Dubuque. Deere & Company has been collaborating with VRAC for many years to explore new technologies. EDE's effort to bring them in the course broadcast is a significant contribution to this collaboration.

The course will cover a range of topics including

- a historical perspective on virtual reality systems
- an examination of human perception
- characteristics of and interactions with virtual environments
- software, intelligent agents in virtual environments
- psychophysical effects and applications

As ISU students attend the course, they listen to instruction being delivered live from the various locations. Since video-conferencing is the primary mode, students are able to interact with the instructors in real time.



Dr. Carolina Cruz-Neira, VRAC Associate Director

VRAC Associate Director Dr. Carolina Cruz-Neira is teaching four of the sessions. She is also providing an introduction and wrap-up discussion on either end of the other 26 video-conference sessions that are taught by the leading researchers. As part of their class credit, ISU students are applying the knowledge acquired in the classroom to develop virtual reality projects for the Howe Hall auditorium. At the end of the semester, the IE 584 students and Dr. Cruz-Neira will showcase the final projects for the public in the Howe Hall auditorium.

EDE staff are working closely with Dr. Cruz-Neira and Old Dominion University to make sure that the delivery of the interactive live sessions is successful. EDE is also collaborating with Deere & Company in both Moline and Waterloo to provide a live Web cast over the Internet for its engineers. Participants are able to see the course in real time and interact using Net Meeting to ask questions or provide comments during each session.

Applications in virtual reality systems encompass several areas including scientific data visualization, engineering training and education, and even art. While the disciplinary boundaries have blurred, virtual reality, also known as virtual environments, has become an important research area with contributions coming from many areas, such as computer engineering, computer science, electrical engineering, mechanical engineering, mathematics, and psychology. Future plans for the course include an asynchronous delivery mode by the spring of 2003.

For more information about this course or to find a complete list of courses offered by the College of Engineering to off-campus students, visit the EDE Web site at www.ede.iastate.edu or call at 800-854-1675.

President calls for major technology spending increase

By Kathy Bryan, IPOC

In his FY2003 budget, President Bush will request a 15.5 percent increase in spending for information technology. This is the biggest increase in at least five years, according to Mark Forman, associate director for information technology and e-government at the Office of Management and Budget. A significant portion of the IT budget increase is related to cyber security.

The President will ask Congress for \$52 billion to be spent on technology products and services focusing on his three primary goals for the nation: winning the war on terrorism, increasing homeland security, and revitalizing the economy. The budget will fund more than 900 major technology projects costing \$18 billion and over 2,000 significant technology projects totaling \$11.5 billion. Funding for intelligence agencies or block grants to state and local governments to help them buy technologies for domestic security is not included in the \$52 billion.

GSA's proposed budget boosts e-government and building security

The Bush administration's fiscal budget proposal for the General Services Administration (GSA) includes the largest request to date for e-government initiatives, building repair, and increased security at federal facilities. The administration is seeking \$5 million to expand and redesign the FirstGov (www.firstgov.gov) Web portal as part of its e-government strategy. FirstGov is envisioned to become a "one-stop point of service" rather than just a search engine. The redesigned Web site will allow visitors to access the services they need in only three mouse clicks.

The administration is also asking for approximately \$1.5 billion to be earmarked for GSA to maintain and manage federal facilities. This includes \$556 million for construction and acquisition of federal facilities and \$986 million to repair and renovate existing buildings. It is estimated that more than \$4 billion is needed to repair and upgrade federal buildings. Additionally, the GSA budget proposal asks for \$400 million to improve security in federal buildings. Funds will be used for more guards, security devices, and reinforcing walls, windows, and roofs.

New SUB-Net feature simplifies subcontracting process

SUB-Net (www.subnet.gov) is a Small Business Administration (SBA) Web site where prime contractors list subcontracting opportunities for small businesses. A new, recently activated Internet system has drastically simplified the identification process. In the past, firms had to go to SUB-Net to check on available subcontracting opportunities. Now, when a subcontracting opportunity with a matching North American Industry Classification System (NAICS)

code is posted on SUB-Net, it automatically notifies businesses registered in PRO-Net that have a matching NAICS code. One requirement, however, is that businesses must keep PRO-Net profiles up to date. PRO-Net's default setting only displays profiles updated within the last 18-month period. Contact the Iowa Procurement Outreach Center at 800-458-4465 for help and information on this resource.

Small business workshops

Day-long workshops, sponsored by Small Business Development Centers (SBDC) and IPOC/CIRAS in cooperation with the U.S. Small Business Administration (SBA), give small business owners and potential entrepreneurs the tools they need to be successful. Following are the dates and locations for future workshops:

March 21, 2002
June 20, 2002

Davenport SBDC
Creston SBDC

For information on the workshops or to make reservations for the breakfast events below, contact Kathy Bryan at 800-458-4465 or kbryan@ciras.iastate.edu.

Breakfast, Business & More

The Breakfast, Business & More events provide an excellent opportunity for entrepreneurs to meet other business owners, corporate buyers, and new clients. This event also opens up avenues to meet federal and state area representatives and visit with local business service programs that can assist in business growth.

The breakfasts begin at 7:30 a.m. and will be held at the Des Moines Downtown Holiday Inn on the following days:

March 14	Legal Issues for Small Business 8(a) Contracting Opportunities— roundtable discussion 9:00–10:00 a.m.
May 2	Organizing Your Office
July 11	2 nd Annual Mini Expo
September 12	Hiring Practices
November 7	E-commerce for Small Business

The facilitator for these events is Ted Williams, CEO of the Williams Group, Inc., Des Moines, Iowa. Breakfast, Business & More is sponsored by Channell Construction Iowa & Nebraska, Principal Financial Group, and the Minority & Women Business Conference & Expo and is in cooperation with IPOC/CIRAS, Drake Small Business Development Center, and Small Business Administration.

new layout will improve workflow, make the facility more manageable, and allow for future expansion.

“The simulation process was timely, helpful, and informative,” said HELC President Scott Giles. “Now, I can only hope the actual moving process will go as smoothly as did the layout process,” he added.

R. S. Bacon Veneer Company

R. S. Bacon Veneer Company, which manufactures and exports wood veneers, was struggling to meet the demand of its increasing sales volume. The company contacted CIRAS for assistance in evaluating layout alternatives that would increase productivity at its Grundy Center, Iowa, plant.

Process

After an initial training session that explained the scope and purpose of the project and a demonstration of the simulation tools to be used, the project began with volunteer representatives from each department submitting an optimal layout plan for each of their respective areas. While they were working on the plans, data collection tasks were completed, and a current state model was constructed using ProModel™. Using the input and results from the current state model, the team met several times to put all the individual departmental plans into one optimized plan for the entire plant. This plan was then modeled with ProModel™ to create a working simulation, including calculated output results of the new layout.

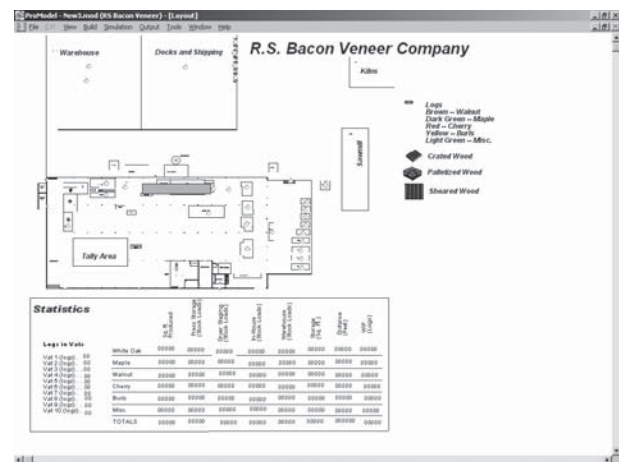
Results

The results showed that the proposed change would double the plant’s output while still using the same number of employees. The output results generated by the model enabled the company to obtain management support and financing for a \$2 million expansion that included

incorporating the new layout, constructing a domestic and European warehouse, and adding loading docks and a boiler system to burn waste wood for power.

“Today, there is a pattern,” said Joe Darter, General Manager of Bacon Veneer. Before the plant layout simulation, workers weaved through the plant like a spider web, a process that was costing the company quite a bit of time and money. The new plant layout has increased production square footage by 57% and has cut the distance material has to travel internally by almost 50%. In addition, the improvements at Bacon Veneer has helped secure the jobs of its employees, 85% of whom live in Grundy Center.

For more information on plant layout simulation, contact Mike Willett at 319 266-3260, mwillett@ciras.iastate.edu, or John Van Engelenhoven at 641 791-0765, jve@ciras.iastate.edu.



Screen shot of the actual model used for the project in ProModel™.

ISO 9001-2000 focuses on customer satisfaction and loyalty

By Merle Pochop, CIRAS

January 1, 2001, marked the true millennium for most people, but for Iowa manufacturers and processors, it signaled the official start of the ISO 9001-2000, the new ISO 9000 standard. The change to the new standard from the 1994 version will be phased in so that ISO-certified companies and those planning to become compliant have time to adjust their systems to meet the new requirements.

The revised ISO 9001, with its strong focus on customer satisfaction, represents a unique opportunity for companies to implement significant improvement that will help them gain a competitive edge in today’s markets. Specifically, Paragraph 5.2 of the new ISO standard states that “top

management shall ensure that customer requirements are determined and fulfilled with the aim of enhancing customer satisfaction (see Paragraphs 7.2.1 and 8.2.1).”^{*} This clearly implies that management is expected to measure customer satisfaction as well as factor it into quality planning for improvement. Similarly, 7.2.1 deals with product or service realization and cites the need to include customer-specified requirements along with service, intended use considerations, statutory requirements, and company needs when planning company operations. Finally, Paragraph 8.2.1 measures

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the success of operations and states that the organization shall “monitor information relating to customer perception. . . .” From these direct references, it is clear then that a company must track customer satisfaction as a part of its overall ability to meet ISO requirements.

Like many aspects of business today, it is possible to “just meet” the requirements of the standard and not derive all the benefits attainable. A more valuable approach would be to use the customer satisfaction requirement factor as a means to improving customer loyalty to company products or services rendered.

The issue of determining customer satisfaction and, more importantly, customer loyalty is not new. For decades, major corporations have pursued this goal by hiring consultants and devoting entire units to answering the question of what satisfies customers. A primary reason for this focus is that the stakes are very high for any business. One major airline, for example, calculates that it will lose 50% of all customers who complain, regardless of whether the complaint is satisfied or not. In other words, if issues that dissatisfy airline customers are not identified and eliminated, the customer base will shrink dramatically. The added impact of the Internet makes this issue even more critical as dissatisfied customers resort to the use of the mouse more quickly than ever before to voice and spread their discontent.

Another important aspect of determining the cause for customer dissatisfaction is the problem of limited resources. Seldom are there enough resources in time or money for businesses to simply “solve” all problems. Problems need to be ranked as to which issue has larger expected impact or which can be solved with the least use of resources. Arriving at some type of reasoned approach by confronting customer satisfaction issues always has high potential value to a company’s success.

So how do you measure customer satisfaction effectively? This is a question that cannot be answered completely in any brief article. Here are examples of the types of effort that companies may consider engaging in, possibly along with what they are already doing now.

1. Benchmark your results against national or trade-group data. Polls taken by industry trade groups provide a reference point for companies to determine if their goals are reasonable. Many of these results are available if you belong to trade groups within your industry or if you are a part of a professional society that regularly conducts polls.
2. Sample customer satisfaction through the use of questionnaires. This is an effective and possibly the best approach if your product is retail, or you sell to a broad spectrum, or if your market is quite large. The techniques and tools needed to gather accurate and reliable information require technical expertise available through numerous companies that specialize in this area.
3. Gain information on customer needs by using structured interviews. This technique lends itself to situations where the company may have significant sales but with a relatively small number of customers. For example, if you are selling metal fabrications to twenty-five customers, who you would describe as significant to your business, this approach conducted by your sales force might be the most suitable.
4. Employ special measures for important single customers. In this instance, sending a sales person to talk about customer needs won’t do. The best resource will be your CEO, whose goal may be to determine what it will take to maintain your position as a sole source for the customer. Again, you can’t do this in a vacuum. Knowledge gained about your industry through other sources will supply a portion of your customer satisfaction determination. Also, if you are going to be asked to go the extra mile, the added value should be rewarded.
5. Suit your perception of products as it applies to different customers. The data you collect will focus on how well you determine a product or service is successful as it relates to customer perception. For example, if customers derive satisfaction by having their needs identified, knowing how much time is actually spent listening to customer input may be an important clue to failures in communication.

Other tools that can be used to improve product conformity to customer input include design for manufacturing, quality function deployment work, and focus on marketing impact.

There is no ISO 9001 rule that states that methods listed here are mandatory. What is important, however, is that ISO practitioners recognize that there are ways to increase value through improved methods. While companies with marketing departments might direct that steps be taken to determine customer satisfaction, how well these measures impact success will prove to be the bottom line.

*From ANSI/ASQ ISO 9001:2001, Quality Management System Requirements

For more information on ISO implementation issues, contact Merle Pochop at 717-274-0048 or mpochop@ciras.iastate.edu.

Cedar Falls Industry Outreach Center expands scope and services

By Mike Willett, CIRAS

The Cedar Falls Industry Outreach Center was developed by CIRAS and Iowa State University Extension to help manufacturing companies in northeast Iowa gain improved access to resources necessary for economic development. The center is managed by CIRAS, which partners with ISU technology units, such as the Institute for Physical Research and Technology, Center for Advanced Technology Development, Iowa Companies Assistance Program, and Engineering Distance Education, to bring a variety of resources for local manufacturers.

The outreach center demonstrated a strong surge in activity beginning January 2001 with the total number of events jumping from 35 in the year 2000 to 78 last year. Attendance at events generated by the center was up, from 562 in 2000 to 962 last year. The number of companies served is also up from 20 to 54, indicating that more companies benefited from comprehensive assistance in the following areas:

Specialized training, workshops, and short courses

- Based on a survey identifying client needs, the center offered courses and training in software selection, product design and testing, plant layout, computer simulation for process development and improvement, using Microsoft Office tools for information management, and on-going engineering and business issues.
- The center has initiated Lean Manufacturing training events and began the first Theory of Constraints (TOC) discussion group that continues to hold scheduled meetings every other month.
- Workshops were offered in value-added manufacturing, rapid prototyping, state and federal bids preparation, TOC, ISO 9000 auditor training, and research and technology transfer.
- Distance education short courses in mechanical engineering durability and design and understanding finite element analysis had excellent attendance.

Industry contacts

- The center created a new industry spotlight display area within its facility to encourage and promote interaction between businesses and regional manufacturing clients.
- Two distance education courses conducted at the center strengthened local ties with John Deere and attracted other large Iowa manufacturers, such as Maytag and Fisher Controls, into the fold of area businesses.
- The center is rapidly becoming a popular off-site meeting facility for individual company meetings, industry groups, and service providers, paving the way for increased collaborative ventures.
- John Deere agreed to host the "In Tune with Agriculture Institute" training program, an event set in motion by the center and aimed at strengthening local ties with ISU.

Networking with local businesses and statewide service providers

- The Eastern Iowa Networking Breakfast was revitalized, allowing industry entrepreneurs and businesses to initiate contact and exchange ideas.
- The center hosted several events including the Employers Council of Iowa, Iowa Department of Natural Resources, Industries of the Future, Cedar Falls Chamber of Commerce, Iowa Northland Regional Council of Governments, Iowa Procurement Outreach Center, and various service provider groups within ISU and the University of Iowa.
- The center renewed its annual contract as the host location for the Cedar Valley Manufacturers Association with added emphasis on grant evaluation, selection, and administration and operational support for the center.

Expanded communication capabilities

- The center obtained and set up the necessary infra-structure to provide the first National Technological University satellite downlink, opening up access to national and international speakers, forums, and interactive workshops. Several presentations were made possible through NTU, including
 - a lecture, titled "Seven Habits of Highly Effective People," by Dr. Steven Covey, who talked about new manufacturing and non-manufacturing practices
 - a seminar by Michele Ginnerty on how to build effective teams in today's work world
 - a conference by Eli Goldratt (creator of TOC) on ways to make information technology investments achieve bottom line results.

For more information, contact Mike Willett at 319-266-3260, mwillett@ciras.iastate.edu, or the Industry Outreach Center, Cedar Falls Industrial and Prairie Technology Business Park, 7103 Chancellor Dr., Suite 200, Cedar Falls, Iowa.

Mark your calendars

The 2002 N. E. Iowa Manufacturing Exposition will be held Tuesday, October 8, 2002, from 10 a.m. to 6 p.m. at the Five Sullivan Brothers Convention Center in downtown Waterloo, Iowa. More information will be forthcoming in the next issue of the CIRAS newsletter.

Meanwhile, give your company a head start! Contact the Cedar Valley Manufacturers Association/CIRAS office at 319-266-3390 for exhibitor or ticket information.

Discounts are available for early registration.

Deadline for early registration is July 1, 2002.

IWE offers reuse and recycling options for manufacturers

By Jeff Beneke, Iowa Waste Reduction Center, UNI, and Sunanda Vittal, Engineering Communications and Marketing

It's a well-known fact that CIRAS' ability to partner with state and federal agencies means crucial benefits to manufacturing companies and the state of Iowa. One such instance is the growing collaborative effort between CIRAS and the Iowa Waste Exchange (IWE), one of the nation's premier waste exchange programs.

Established in 1990 by the Iowa Legislature to divert waste materials from the state's sanitary landfills, the IWE offers proactive assistance in identifying reuse and recycling options for commercial and industrial waste. The IWE is a cooperative effort between Recycle Iowa/Iowa Department of Economic Development, Iowa Department of Natural Resources, Iowa Waste Reduction Center, Community Colleges, Council of Governments, and solid waste agencies.

In several instances the CIRAS program has partnered with IWE area resource specialists to work directly with waste generators and potential markets in their areas. Since its inception, the IWE program has diverted over 640,000 tons of waste materials from disposal sites, saving Iowa businesses over \$16 million in avoided disposal costs.

An excellent example of the benefits from the IWE program surfaces in the case of the Heinz USA company in Muscatine, Iowa. Julie Plummer, an IWE specialist in eastern Iowa, helped Heinz successfully divert an aluminum foil/plastic laminate material from its landfill. During the fall of 2000, Plummer matched the material to US Granules Corporation, located in Plymouth, Indiana. US Granules processes industrially generated laminated aluminum foil scrap by recovering the aluminum and subsequently manufacturing aluminum granules used in

a wide variety of industrial applications. The transportation costs for this operation are being covered by US Granules Corporation, while the company will pay Heinz \$30 per ton for the material.

To date, 120,000 pounds of the aluminum foil/plastic laminate material have been transported from the Heinz facility and processed by US Granules Corporation, saving the company over \$2,000 in disposal costs and generating a revenue of \$1,800. Over one year, Plummer estimates that Heinz will divert over 1,200 tons from the landfill and save over \$44,000 in disposal costs. Heinz is currently working towards implementing a method that separates the clean end scrap from the ketchup-contaminated laminate material as a way to recycle additional quantities of this waste material.

CIRAS collaboration with the IWE program plays out in subtle yet critical ways.

"Many times a company's waste has a direct relationship with its quality manufacturing methods and its use of technology. This is where CIRAS can help to reduce waste and scrap," said CIRAS Process Development Specialist Rudy Pruszko.

"For example, a company's excess scrap may be related to a process or quality that is causing the creation of the scrap or waste in the landfill. CIRAS can help eliminate the cause of that waste by working together with the IWE. We can provide short- and long-term solutions to manufacturing problems."

Pruszko said he makes it a point to keep in mind a company's waste output while touring a site. Working with IWE, he said, has expanded his knowledge of ways to save money for clients.

The CIRAS contact for waste management practices is Rudy Pruszko, 563-556-5110, ext. 251, or rpruszko@ciras.iastate.edu.

Iowa Waste Exchange (IWE) areas and specialists

AREA A

Perry Nelson

Western Iowa Tech Community College
712-274-8733 or 800-352-4649, ext. 1560

AREA B

Fred Kesten

Region XII Council of Governments
712-792-9914

AREA C

Kathy Millard

North Iowa Area Community College
641-422-4379

AREA D

Julie Plummer

Eastern Iowa Community College
563-336-3319 or 800-462-3255

AREA E

Dennis Hayworth

DMACC Business Resources

AREA F

Rick Meyers

319-398-5665 (Linn County)

John Koch

Kirkwood Training and Outreach
Services Center
319-398-4904

AREA G

Jim Reimer

Indian Hills Community College
641-683-5269 or 800-726-2585, ext. 5269

AREA H

Bill Pendgraft

Iowa Western Community College
712-325-3309 or 800-432-5852, ext. 3309

AREA I

Jodi Jeanes

Iowa Northland Regional
Council of Governments
319-235-0311



For more information on how your company can benefit from the IWE, contact your local specialist, Recycle Iowa at 800-532-1216 or Iowa Waste Reduction Center at 800-422-3109.

Goble heads advisory council By Tim Sullivan, CIRAS



At the March CIRAS Advisory Council meeting, Michael Goble assumed the position of chair. Goble is vice president of Diamond V. Mills, an internationally recognized feed ingredient supplier. Goble heads Diamond V's manufacturing and engineering division, well known for its innovative and scientifically motivated manufacturing processes in the field of animal nutrition.

Goble earned his B.S. in chemical engineering from Purdue University

in 1985 and has resided in Iowa for the past 16 years. He held engineering and management positions with Cargill, Inc., and Genencor International before joining Diamond V in 1995.

Diamond V is best known as the manufacturer of Diamond V XP Yeast Culture. Using advanced biotechnology know-how, Diamond V is investigating the use of yeast strains as a protein expression system to produce new products of interest to the agricultural and biotechnology communities. A strategic technology alliance formed between Diamond V and Kemin Americas, Inc., has integrated core competencies in

biotechnology and animal feeding technologies and has led to the creation of new products of increased value for animal agriculture. Recently, Diamond V acquired its food processing plant license and now manufactures a specialty yeast product for the human nutritional supplement industry.

"Over the past two years many changes have occurred in business and industry," said Goble, who hopes the advisory council will continue to provide CIRAS valuable input relative to these changes. "It is also my hope that the advisory council can provide additional support to CIRAS, outside the quarterly meetings, to increase the presence of CIRAS in the extension service community and at the government level."

The CIRAS Advisory Council membership includes leaders from Iowa manufacturing companies and partner organizations. The group provides guidance to CIRAS leaders and staff regarding programming, financial, evaluation, and marketing issues.

Michael and his wife Vicky live near Cedar Rapids. They have two sons, Brian and Andy, who are both engineering students at ISU, and two daughters, Jessie and Jenna.

CIRAS research into process standards expands client choice

By Reg Clause, CIRAS

Few consulting groups across Iowa offer manufacturing clients the information resource and dynamic knowledge base of CIRAS. While it continues to explore cutting edge marketing and processing techniques, CIRAS has long served as a leader in the training and implementation of advanced management concepts. Chief among these in recent years has been the ISO 9000 process standard. Under its most recent revision, this international, generic standard for achieving process control has also been used to implement continual improvement and customer satisfaction measures. As the ISO standard has evolved, some companies and even industries have taken a proactive approach to their market-place needs by devising specific standards that make ISO fit more precisely into customer needs.

In Europe, for example, ISO 9000 was not well regarded for issues of food safety in years past. Although the revised standard addresses most of these concerns, there is no doubt the 1994 version was more applicable to manufacturing of hard goods while being difficult to

AIB's three-tier certification applies nicely to shippers, millers, and ingredient suppliers within food supply chains.

- 1) **GMP Audit Qualification.** This is the base level for a company to gain control of operational methods and issues such as pest management, food safety, personnel practices, maintenance for food safety, and cleaning.
- 2) **HACCP Audit Qualification.** Under this certification, AIB helps review the applicable HACCP manual and validated critical control point plans. There is an on-site review of the plan and implementation, documentation, and control of documents. The plan is then validated by audit verification of all relevant records and process auditing of issues such as employee training.
- 3) **Quality Systems Evaluation.** Here, a company uses most of the ISO 9000-1994 twenty-elements approach to process control. AIB will help a company set up its standard operating procedures (SOP) program and organization. Protocols for receiving, processing, control of finished product, training, and calibrations are all embedded into the system.

AIB will subsequently maintain an audit program for the client company that uses AIB's Quality Systems Evaluation criteria with an ISO 10011 protocol for auditing. Audit ratings include ideal, exemplary, marginal, and failure. The eight areas of evaluation are raw materials, process control, process verification, finished product acceptability attributes, storage/shipping, instrumentation and analytical calibration, plant policies, and quality policy issues. A rating of ideal or exemplary must be achieved to maintain certification.

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assess the chemistry of scrap and molten metals. Nondestructive techniques will provide fast, accurate, and cost-effective means for determining cast product chemistries and properties.

Top priorities in the roadmap:

1. Develop environmentally benign and dimensionally stable molding and core—make materials
2. Establish a correlation between casting properties and test bars
3. Develop longer life coatings for furnaces and molds

Manufacturing technology

Goals: Increase overall productivity by 15%, reduce average lead times by 50%, and reduce energy consumption per unit value of shipments by 5%.

Vision: Continuous improvement in casting processes, process control mechanisms, material for dies, patterns, cores and refractory material, heat treating, cleaning and post-processing, and energy efficiency will enhance the profitability and competitiveness of Iowa metal casters. Productivity will increase dramatically, consistent quality will be the norm, and production lead times will be slashed.

Top priorities in the roadmap:

1. Develop new technologies in cutting gates, vents, and risers to reduce grinding
2. Develop modeling technology for all casting processes to include optimization of energy use
3. Provide energy audits

Environmental technology

Goals: Reduce waste streams by 25% in the short term; totally eliminate all waste streams in the long term.

Vision: The metal casters in Iowa and the governmental regulatory agencies will work cooperatively to continuously reduce environmental impact, eliminate waste streams, and continuously increase reuse and recycling. This will be done in a way that enhances the viability and competitiveness of metal casting in Iowa and promotes the adoption of new technologies.

Top priorities in the roadmap:

1. Receive tax credits for implementation of technology needed for regulatory compliance (agencies work with, instead of against, industry)
2. Develop a system that requires less paperwork for permits
3. Develop a state database to assist understanding of new regulations

Human resources

Vision: The metal casters in Iowa will offer well-paying, challenging careers. They will retain the best people they currently employ by offering opportunities for professional

enrichment. They will attract qualified personnel by supporting students who show an interest in metal casting careers and by becoming more active with high-school vocational-arts and school-to-work programs. Metal casters will provide attractive opportunities for non-traditional workers such as women and non-English-speaking minorities.

Top priorities in the roadmap:

1. Develop new training methods for in-house, self-directed education programs for all employees by offering day or evening courses based on need, availability, flexibility, testing, and privacy
2. Increase partnering with local, state, and national professional organizations, educational institutions, government agencies, etc
3. Resolve ergonomic issues by developing new ways to do hard tasks that reduce risk to employee health

Profitability and industry health

Vision: Metal casters in Iowa will actively adopt best practices and adapt research developments to enhance the performance of their industry. Once they experience the benefits, metal casters will invest a higher portion of their increased profits into more research and development, thus creating an upward spiral that enhances the worldwide competitiveness of Iowa metal casters.

Top priorities in the roadmap:

1. Generate recognition, from the CEO on down, of the importance of customer service and customer satisfaction
2. Receive tax credits for research and development, environmental compliance, and technology upgrades
3. Gain access to capital for additional spending on new plants and equipment

Follow-through

In the coming years, the Metal Casting Center (MCC) at UNI will lead the state's metal casting industry along this roadmap in pursuit of the Iowa Vision. To address Iowa priorities, the MCC will form "action teams" that will assess the current situation and available resources. Each team will then form an action plan for achieving its objective. The MCC will continue to work with the IOF Metal Casting Steering Committee to assure that activities are properly focused.

To receive the complete document, "Metal Casting Vision and Roadmap, Iowa Industries of the Future," contact the Metal Casting Center at UNI, 319-273-6894 or view it online at www.ciras.iastate.edu/iof. For information on any of the nine IOF focus industries, contact Tim Sullivan at 515-727-0656 or tsullivan@ciras.iastate.edu.

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CIRAS research

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implement for effectiveness in some food processing/shipping operations. This is where the American Institute of Baking was able to establish its niche.

Centered out of its sprawling test lab and teaching center in Manhattan, Kansas, AIB has become a leader in multi-level certification of shippers and processors in the food industry. Its approach involves using the structure of the ISO standard but making the process uniquely robust as it addresses specific food safety issues. The certification would be under-written and maintained through audit programs conducted by AIB, thus giving the end user/customer quality assurance and value.

CIRAS will be working closely with Dr. Charles Hurburgh at the Iowa Grain Quality Initiative on the ISU campus to be a content provider for this standard and will ramp up CIRAS resources as demand indicates.

CIRAS staff are also establishing relationships and collecting materials on the USDA-Agricultural Marketing Service

process verified standard. AMS is becoming an active participant in vertically integrated/coordinated food product supply chains that require specific process control. The agency first established its operating standards to control the massive food procurement programs of the US federal government. Now, the standard is in place for companies like Premium Standard, PM Beef Group, Farmland Foods, and more. Additionally, AMS administers programs such as Certified Organic and Certified Non-Hormone Fed Beef.

Alternate programs, such as AIB and AMS, are satisfying specific markets, and while ISO 9000 is the gold standard of quality management systems, CIRAS is always sensitive to the marketplace for new ideas and alternatives.

For more information on quality standards, contact Reg Clause at 515-576-0099, ext. 2730, or rclause@ciras.iastate.edu.